

# Profile of Spontaneous Primary Hypothyroidism in Adults at the Abass Ndao Hospital: Based on 302 Cases Collected

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**How to cite this paper:** Djiba, B., Sow, D., Dieng, M., Ndour, M.A., Diembou, M., Daoussa, A., Diallo, I.M., Halim, C., Diedhiou, D., Sarr, A. and Mbaye, M.N. (2025) Profile of Spontaneous Primary Hypothyroidism in Adults at the Abass Ndao Hospital: Based on 302 Cases Collected. *Open Journal of Internal Medicine*, 15, 8-17.

<https://doi.org/10.4236/ojim.2025.151002>

**Received:** October 15, 2024

**Accepted:** January 23, 2025

**Published:** January 26, 2025

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## Abstract

**Introduction:** Primary hypothyroidism is a deficiency in thyroid hormone secretion due to primary damage to the thyroid gland, resulting in a state of hypometabolism. It may be spontaneous or acquired, permanent or transient. Hypothyroidism is less studied in our context. Hence, we deemed it necessary to study the profile of adult patients followed over a 13-year period in a reference center specialized in monitoring metabolic and endocrine diseases, the Abass Ndao Hospital in Senegal. **Patients and Methods:** This was a retrospective descriptive study. Adult patient records followed for spontaneous primary hypothyroidism were collected over a 13-year period from January 2011 to April 2023. **Results:** In total, 302 patients were enrolled. There was a peak in patient frequency in 2021 (14.9%), followed by 2020 (11.9%) and 2012 (10.6%). The mean age of our patients was  $40.2 \pm 16$ . Clinical and paraclinical signs included asthenia (39.70%), facial edema (7.62%), headache (13.20%), myalgia (4.64%), constipation (29.80%), and menstrual disorders (2.32%). Clinical examination of the thyroid revealed the presence of a goiter in 228 patients (75.5%). All patients had a thyroid function test. Free T4 was low in 244 patients (80.8%). TSH was elevated in 296 patients (98.0%). Anti-thyroperoxidase antibodies (ac anti-TPO) were positive in 288 patients (95.4%). Heterogeneous diffuse goiter was noted in 205 patients (67.9%), followed by thyroid atrophy in 24.5%. The most frequent etiology in our patients was Hashimoto's thyroiditis (74.83%), followed by chronic atrophic thyroiditis (23.84%). Twenty-three patients had hypertension (41.10%), 19 had diabetes mellitus (33.90%), and 4 had adrenal insufficiency (7.14%). Levothyroxine was used in 297 patients (98.3%). The mean dose of levothyroxine was  $67.17 \mu\text{g}$ . **Conclusion:** Primary hypothyroidism is a frequent endocrine disease. Early diagnosis remains crucial to prevent long-term complications. Treatment with levothyroxine has greatly improved

patients' quality of life. However, challenges remain, particularly in terms of dosage adjustment, long-term follow-up, and management of subclinical forms.

## Keywords

Primary Hypothyroidism, Hashimoto's, Levothyroxine, Senegal

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## 1. Introduction

Primary hypothyroidism is a deficiency in thyroid hormone secretion due to primary damage to the thyroid gland, resulting in a state of hypometabolism. It may be spontaneous or acquired, permanent or transient [1]. It is a condition encountered in everyday practice and has a major impact on quality of life.

The diagnosis of primary hypothyroidism is made on the basis of a combination of very uncharacteristic clinical arguments and thyroid hormonal data. The diagnostic delay subsequently leads to an increase in morbidity and mortality linked to cardiovascular, neurological (myxedematous coma) and metabolic (dyslipidemia) events [1]. Certain risk factors (such as autoimmunity, exposure to a physical or medicinal agent, and damage to the thyroid parenchyma by thyroiditis) are subject to an etiological diagnosis. A study carried out in Senegal in 1984 reported a prevalence of 0.58% [2], with patient ages ranging from 20 to 80 years and a mean age of 45.6 years. In our context, primary hypothyroidism is underestimated and predominates in women, probably due to the increased prevalence of autoimmunity. Hypothyroidism is less studied in our context; hence, we deemed it necessary to study the profile of adult patients followed over a 13-year period in a reference center specialized in monitoring metabolic and endocrine diseases, the Abass Ndao Hospital in Senegal.

## 2. Patients and Methods

This was a retrospective descriptive study. Adult patient records followed for spontaneous primary hypothyroidism were collected over a 13-year period from January 2011 to April 2023. The study was conducted at the endocrine outpatient clinic of the Clinique Médicale II of the Abass Ndao Hospital, Senegal.

All known adult patients with spontaneous primary hypothyroidism were included. Patients with history of post-thyroidectomy hypothyroidism, post-radiation therapy hypothyroidism, iatrogenic hypothyroidism (from lithium, Interferon alpha or iodized products), and incomplete records were excluded. Data were collected using a pre-established survey form. The data collected included socio-demographic, clinical, paraclinical, therapeutic and evolutionary data.

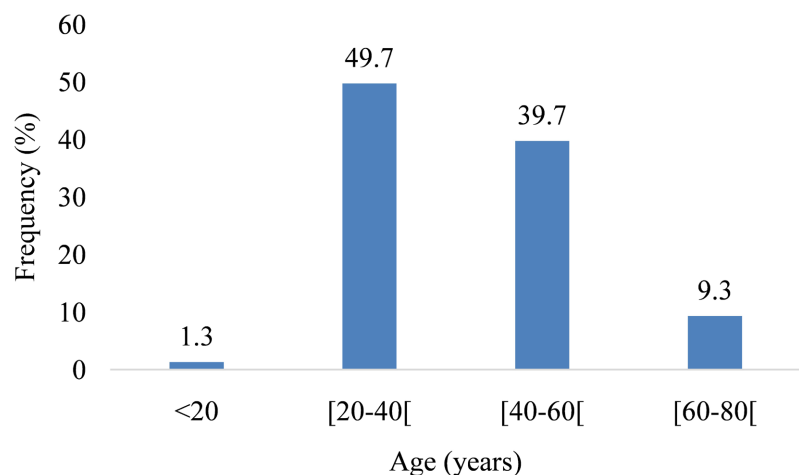
These data were collected anonymously. The data were collected on individual collection sheets with respect to and entered using the SPHINX DEMO V software. The analysis and processing of the data were done on the SPSS 20.0 software

and the figures using the EXCEL 2007 software. The test independence of chi-square was used for the bivariate analysis with a significance threshold set at  $p < 0.05$ .

### 3. Results

#### 3.1. Epidemiological Data

In total, 302 patients were enrolled. There was a peak in patient frequency in 2021 (14.9%), followed by 2020 (11.9%) and 2012 (10.6%). The mean age was  $40.2 \pm 16$ , with extremes ranging from 16 to 76 years. The most represented age groups were [20 - 40[ and [40 - 60[ with proportions of 49.7% and 39.7% respectively (**Figure 1**). The sex ratio was 0.04. Married patients were the most represented with  $n = 247$  or 81.8%. Most patients came from Dakar with  $n = 213$  patients or 70.5%, followed by Thiès with  $n = 23$  patients or 7.6% and Touba with  $n = 10$  patients or 3.3%. Among the patients, 18 (5.96%) had a personal history of Graves' disease, and 7 (2.32%) had tuberculosis. A family history of thyroid disorders was present in 35 patients (11.6%).



**Figure 1.** Distribution of patients by age group.

#### 3.2. Clinical Data

At the diagnosis of hypothyroidism, signs and symptoms of hypothyroidism were noticed by patients more than 5 years before consultation in 13.90% patients, and between 1 and 5 years in 53.98% patients. Only 32.12% had consulted a doctor within 1 year after noticing the symptoms.

The most frequent general signs were asthenia ( $n = 120$ , *i.e.* 39.70%), weight loss ( $n = 45$  or 14.90%), weight gain ( $n = 41$ , *i.e.* 13.60%) and chills ( $n = 31$ , *i.e.* 10.3%). Dyspnea ( $n = 19$  or 6.29%), followed by hypoacusis ( $n = 12$  or 3.97%) and dysphonia ( $n = 5$  or 1.66%) were reported.

The predominant cutaneous signs were facial edema ( $n = 23$  or 7.62%), hair loss ( $n = 19$  or 6.29%) and edema of the hands and feet ( $n = 10$  or 3.31%) (**Table 1**). Other signs were loss of eyebrow tail hair, dry skin and macroglossia. Neuromuscular

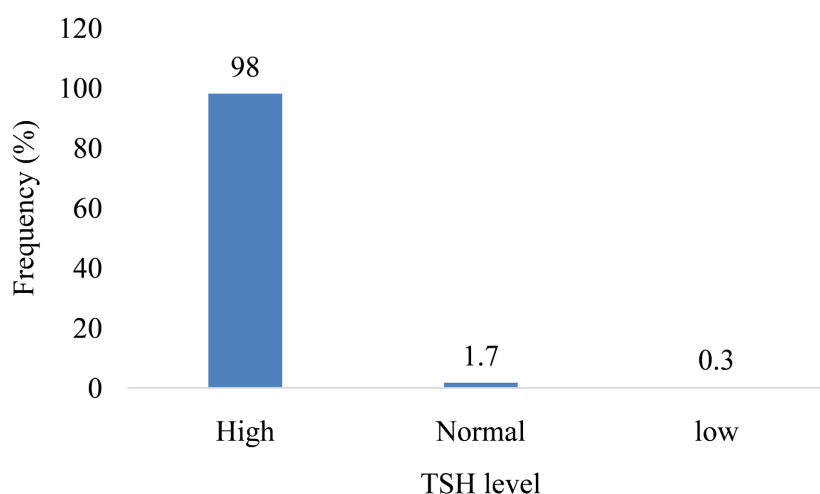
and articular signs were headache (n = 40 or 13.20%), followed by myalgia (n = 14 or 4.64%) and paresthesia (n = 13 or 4.30%). The most frequent digestive sign was constipation (n = 90, 29.80%), while genital signs included menstrual disorders (n = 7, 2.32%). Clinical examination of the thyroid revealed the presence of a goiter in 228 patients (75.5%).

**Table 1.** Distribution of patients according to cutaneo-phanerian signs.

Cutaneo-phanerian signs	Effective	%
<b>Eyebrow tail hair loss</b>	7	2.32%
<b>Hand and feet edema</b>	10	3.31%
<b>Hair loss</b>	19	6.29%
<b>Dry skin</b>	4	1.32%
<b>Macroglossia</b>	2	0.66%

### 3.3. Paraclinical Data

Full blood count was done by all patients. Microcytic anemia was found in 30 patients (10%), normocytic anemia in n = 26 (9%) and macrocytic anemia in 3 patients (1%). Calcemia was performed in 31 patients (10.26%), with extremes ranging from 80 to 106.1 mg/l, with an average of 92.5 mg/l. Blood glucose levels were measured in all patients, with extremes ranging from 0.68 to 2.15 g/l (mean 0.93). All patients had undergone a thyroid function test (100%). Free T4 was low in 244 patients (80.8%). TSH was high in 296 patients (98.0%), normal in 5 (1.7%) and low in 01 (0.3%) (**Figure 2**). Anti-thyroperoxidase antibodies (TPOAb) were positive in 288 patients (95.4%) and normal in 14 patients (4.6%).

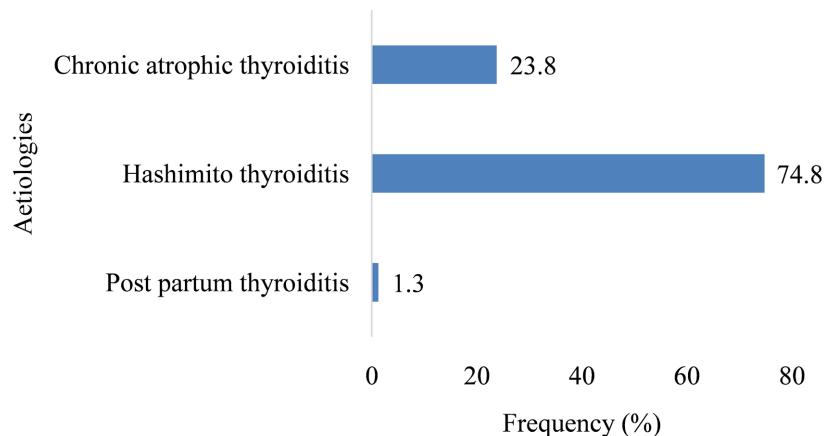


**Figure 2.** Distribution by TSH level.

Heterogeneous diffuse goiter was noted in 205 patients (67.9%), thyroid atrophy in 74 patients (24.5%) and thyroid nodules in 23 patients (7.6%). None of our patients had undergone thyroid scintigraphy.

### 3.4. Etiological Data

The most frequent etiology was Hashimoto's thyroiditis in 226 patients or 74.83%, followed by chronic atrophic thyroiditis in  $n = 72$  or 23.84% and post-partum thyroiditis in  $n = 4$  or 1.32%. **Figure 3** shows the distribution of patients by etiology.



**Figure 3.** Distribution of patients by aetiologies.

Among our patients, 23 had hypertension (41.10%), 19 had diabetes mellitus (33.90%) and 4 had adrenal insufficiency (7.14%).

Other pathologies included Biermer's disease (5.36%), sickle cell disease (5.36%) and rheumatoid arthritis (3.57%).

### 3.5. Therapeutic and Follow-Up Data

Levothyroxine was used in 298 patients (98.63%). The mean dose was 67.17  $\mu\text{g}$ , with extremes ranging from 25 to 200  $\mu\text{g}$ .

For the initial dose, 46 patients were taking Levothyrox 25 (15.7%), 115 patients were taking Levothyrox 50 (38.3%), 62 patients were taking Levothyrox 75 (21.3%), 53 patients were taking Levothyrox 100 (17.7%), 6 patients were taking Levothyrox 125 (2%), 13 patients were taking Levothyrox 150 (4.3%) and 2 patients were taking Levothyrox 200 (0.7%).

For the definitive dose, 1 patient was on Levothyrox 12.5, *i.e.* 0.3%, 34 patients were on Levothyrox 25, *i.e.* 11.3%, 78 patients on Levothyrox 50, *i.e.* 26%, 76 patients on Levothyrox 75, *i.e.* 25.3%, 77 patients on Levothyrox 100, *i.e.* 25.7%, 21 patients on Levothyrox 125, *i.e.* 7.0%, 9 patients on Levothyrox 150, *i.e.* 3.0%. 3 patients on Levothyrox 175 (1%) and 1 patient on Levothyrox 200 (0.3%).

About two patients (0.6%) had no treatment.

At the first month of disease progression, free T4 was measured in 29 patients. The mean free T4 was 11.71  $\mu\text{mol/L}$  with extremes ranging from 0.92 to 29.1  $\mu\text{mol/L}$ . Ultrasensitive TSH (TSHus) was also measured in 44 patients, with an average of 29.7 IU/ml. Hypothyroidism was persistent in 34 patients (79.1%), euthyroidism was achieved in 8 (18.6%) patients and hyperthyroidism was found in 1 (2.3%)

patient.

At month 4 treatment, TSHus was measured in 116 patients. The mean TSHus was at 13.9  $\mu$ IU/ml with extremes ranging from 0.044 to 135.75  $\mu$ IU/ml. Free T4 was measured in 23 patients (mean at 11  $\mu$ mol/L). Of these patients, 50 (45.5%) achieved euthyroidism and 60 (54.4%) had persistent hypothyroidism.

At 9th month treatment, TSHus was measured in 178 patients. The mean TSHus was 4.12  $\mu$ UI/ml, with extremes ranging from 0.004 to 131.3  $\mu$ UI/ml. Free T4 was measured in 207 patients, giving an average of 14.1  $\mu$ mol/L, with extremes ranging from 1.15 to 26.71  $\mu$ mol/L. Euthyroidism was achieved in 187 patients (61.9%), 72 patients (23.8%) were lost to follow-up, 30 patients (3.9%) had persistent hypothyroidism, 13 patients (3.9%) were being followed up, and one patient had not benefited from treatment.

## 4. Discussion

### 4.1. Epidemiological Aspects

During the study period, we included 302 cases of spontaneous primary hypothyroidism in adults' patients. These patients were followed at the endocrine outpatient consultation unit of the Abass Ndao Hospital. The frequency of patients with hypothyroidism was high for two consecutive years. In 2021, there were 45 patients (4.92%) and in 2020, there were 36 patients (4.74%). Several authors [3] [4] have reported a frequency ranging from 1% to 10.3% of thyroid disorders. Our results remain within the same range as the international literature, confirming its frequency in our day-to-day practice.

The mean age of our patients was  $40.2 \pm 16$  years, with extremes ranging from 16 to 76 years. This age range is in line with the international literature [5] [6]. In Senegal, a study by Sidibé *et al.* [2] reported 45.6 years. From these studies and the literature, we can see that the most frequent average age of onset of adult hypothyroidism is over forty.

Most of our patients were female, with 288 female patients (95.4%), giving a sex ratio (M/F) of 0.04. The female predominance of spontaneous primary hypothyroidism reported in our study confirms the international literature [7]-[9]. These studies provide ample evidence that hypothyroidism is predominantly female.

Seven patients had a personal history of tuberculosis, which could lead to primary hypothyroidism. Primary involvement of the thyroid gland by tuberculosis is exceptional [10]. A family history of thyroid disorder was found in 35 patients (11.6%).

### 4.2. Clinical Data

Most patients ( $n = 163$ , 53.98%) consulted between 1 and 5 years within the onset of the disease. The long delay in consultation of patients with spontaneous primary hypothyroidism results from the discreet and unspecific manifestations of signs of hypothyroidism.

The most frequent sign in our study was asthenia, with a frequency of 39.70%. This is similar to the study by Sidibé *et al.* [10], who found that asthenia was present in 40%. Weight gain, chilliness, bradycardia, constipation, hypoacusis and dyspnea were the main signs of hypometabolism found, this is in accordance with literature findings [10].

The most frequent cutaneous sign was facial edema, with a frequency of 7.62%. This was close to the results of Dramé *et al.* [11], who reported 8.5% of cutaneous signs. Hair loss was present in 6.29% of cases. This is essentially described in the literature, with frequencies of 6% respectively already reported by Djrolo *et al.* [12].

Myalgia was present in 4.64% of patients. The association of myopathy and hypothyroidism was first described in 1884. Thyroid myopathy is easily recognized when hypothyroidism is known but becomes difficult when it is of new onset. Paresthesia was found in 13 patients (4.30%).

This is secondary to myxedematous infiltration, resulting in predominantly sensory-motor neuropathy with paresthesia of the extremities and increased frequency of carpal tunnel syndrome (favored by perineural infiltration of the sheath).

On clinical examination of the thyroid gland, goitre was present in 228 patients (75.5%).

### 4.3. Paraclinical Data

In our study, anemia was found in 20% of patients. Hypothyroidism is often associated with haematological abnormalities. These result from the effect of thyroid hormones on hematopoiesis. Hypothyroidism is often associated with various anemias. These are mainly due to a drop in erythropoietin and erythrocyte 2,3-diphosphoglycerate, associated with slowed metabolism or malabsorption of vitamin B12. In addition, thyroid hormones promote mitotic divisions and proliferation of erythroblastic cells [13].

We found a decreased level of free T4 in 80.8% of patients. Our results corroborate those of Dramé *et al.* [11], who found 83.78%. The more obvious the hypothyroidism, the greater the decrease. On the other hand, free T4 was normal in 19.2% of cases. This in no way rules out hypothyroidism. In fact, T4 measurement is only meaningful if TSH is elevated and will help to determine whether the hypothyroidism is frank (decreased T4) or subclinical (normal T4) [11].

We found elevated TSH levels in 98% of patients, with an average of 47.9 IU/ml. The TSH assay remains the reference and key to the diagnosis of hypothyroidism.

Anti-TPO antibodies were positive in 288 patients (95.4%). Anti-TPO antibodies are more sensitive than anti-thyroglobulin for the diagnosis of autoimmune thyroid disease, but less specific [14]. Determination of these antibodies is more expensive in our hospitals.

Heart rhythm disorders and coronary artery disease were found in 8 patients (16.7%) and 7 patients (14.6%) respectively. Coronary involvement in hypothyroidism is secondary to atheromatous plaques induced by the hypercholesterolemia generally present [15].

#### 4.4. Aetiologies

In our study, the most frequent etiology was Hashimoto's thyroiditis, with a frequency of 75%. It is due to lymphocytic infiltration of the thyroid parenchyma secondary to an autoimmune reaction occurring in a particular genetic background and is probably favored by environmental factors. It is 4 to 5 times more common in women than in men [1].

The latter is followed by atrophic thyroiditis with a frequency of 24%, of autoimmune origin and often the evolution of Hashimoto's disease, occurring later, usually after the age of 50 or after menopause in women [1].

Post-partum thyroiditis occurs with a frequency of 1%. Post-partum thyroiditis is often undiagnosed, with symptoms attributed to the consequences of pregnancy; it is more frequent in patients with underlying thyroid autoimmunity [1].

Type 2 diabetes was present in 12 patients (21.4%), followed by type 1 diabetes in 7 patients (11.32%). The frequency of association of type 2 diabetes and hypothyroidism is around 4% in the literature. In the case of type 1 diabetes, this association reflects the high frequency of thyroid autoimmunity [16].

Hypothyroidism can sometimes be part of an autoimmune polyendocrinopathy syndrome, characterized by the presence of various autoantibodies in the serum. This is particularly true of AEPD type 2, which essentially comprises adrenal insufficiency (100% of cases), autoimmune thyroiditis (70%) and type 1 diabetes (50%) [17]. According to a Tunisian series, type 1 diabetes is associated with chronic Hashimoto's thyroiditis in 8% of cases, which is similar to our study. Antithyroperoxidase antibodies are positive in 37% of type 1 diabetics. In all cases, it remains important to look for other autoimmune diseases in this context.

Due to the lack of consensus, screening for these conditions is still a concern because of its therapeutic implication. Hence, in the absence of indisputable evidence of their impact on glycemic control and growth, they are still in the preclinical phase. The screening strategy needs to be better defined. The ISPAD 2000 Consensus Guidelines recommend that, at the time of diagnosis of diabetes, thyroid function tests and antithyroid antibodies should be performed to detect asymptomatic thyroid disease.

#### 4.5. Therapeutic and Follow-Up Data

All patients were on levothyroxine. The mean dose was 68.40 µg, with extremes ranging from 25 to 200 µg. About 115 (38.3%) were on Levothyroxine 50, followed by 64 (21.7%) on Levothyroxine 75 and 54 (17.8%) on levothyroxine 100. Most of our patients were treated with both initial and final doses of levothyroxine, ranging from 50 to 100 µg/day. In other studies, most of their patients were treated with doses ranging from 75 to 150 µg/d [18].

Euthyroidism was achieved in the majority of 187 patients (61.9%) within 9 months of treatment. Hypothyroidism was persistent in 30 patients after 9 months of treatment. Hyperthyroidism was noted in 1 patient (2.3%) at 1 month of treatment. In our study, 72 patients (23.8%) were lost to follow-up. Clinical and biological

stabilization was achieved after 6 to 10 months of treatment. This slowness in achieving thyroid function equilibrium could be related to poor compliance in our patients, but a more in-depth analysis of the factors could help us to identify other factors. Despite the relatively large size of our series compared to other series, we encountered limits such as incomplete explorations and difficult monitoring due to mainly social limits.

## 5. Conclusion

Primary hypothyroidism is a frequent endocrine disease. Early diagnosis remains crucial to prevent long-term complications. Treatment with levothyroxine has greatly improved patients' quality of life. However, challenges remain, particularly in terms of dosage adjustment, long-term follow-up, and management of subclinical forms. At the end of this work, we recommend a better awareness of hypothyroidism and easier access to investigations and medications for patients.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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